

N-Channel MOSFET

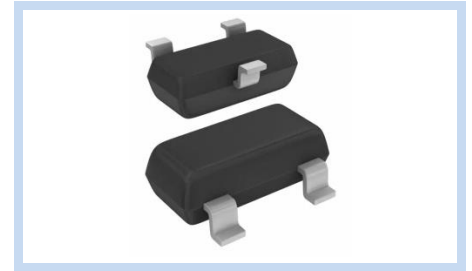
30V 5.5A SOT-23-3

MFT3N5A5S23

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FEATURE

- Operating temperature: -55 ~ 150 °C
- Super high dense cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Low Gate Charge

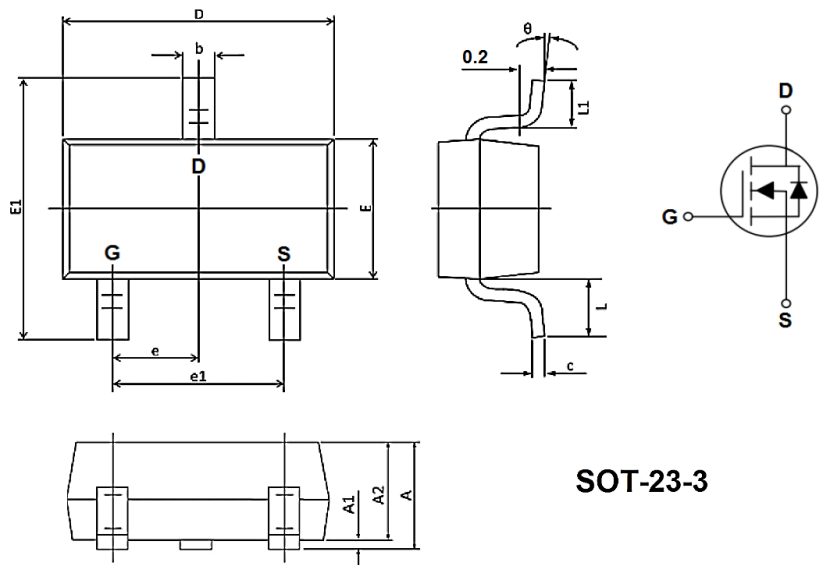


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current at $T_J=150^\circ\text{C}$	I_D	$T_A=25^\circ\text{C}$	5.5
		$T_A=70^\circ\text{C}$	4.4
Pulsed Drain Current	I_{DM}	25	A
Continuous Source Current (Diode Conduction)	I_S	1.5	A
Power Dissipation	P_D	$T_A=25^\circ\text{C}$	1.25
		$T_A=70^\circ\text{C}$	0.8
Operating Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to 150	$^\circ\text{C}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	120	$^\circ\text{C} / \text{W}$

DIMENSIONS

Item	Min (mm)	Max (mm)
A	0.90	1.20
A1	0.00	0.10
A2	0.90	1.10
b	0.30	0.50
c	0.08	0.15
D	2.80	3.00
E	1.20	1.40
E1	2.25	2.55
e	0.95 TYP	
e1	1.80	2.00
L	0.55 REF	
L1	0.30	0.50
θ	0°	8°



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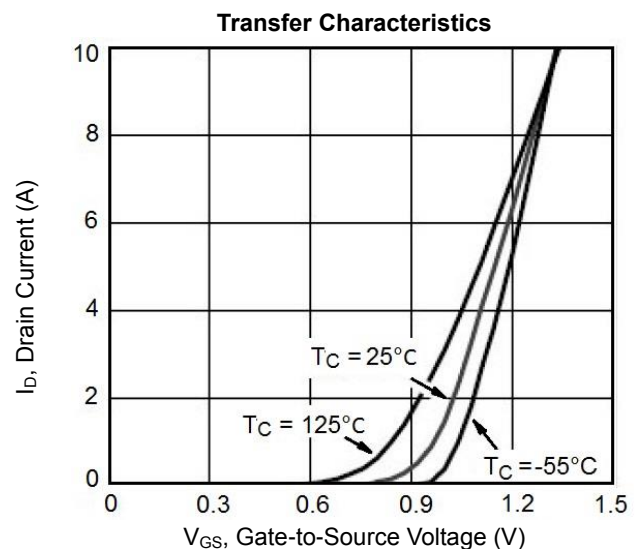
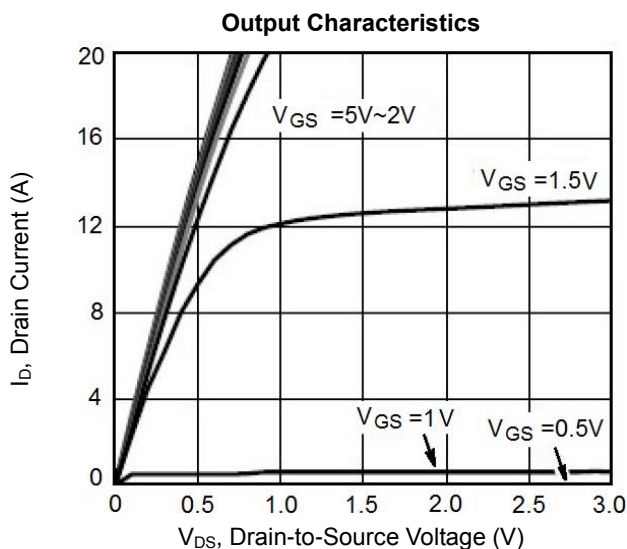
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ELECTRICAL CHARACTERISTICS

Static Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	$V_{(BR)DSS}$	30	--	--	V
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	0.6	--	1.1	
Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 16V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS}=24V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
	$V_{DS}=24V, V_{GS}=0V, T_J=85^\circ C$		--	--	30	
On-State Drain Current	$V_{DS}\geq 5V, V_{GS}=10V$	$I_{D(on)}$	10	--	--	A
Drain-Source On-Resistance	$V_{GS}=10V, I_D=5.0A$	$R_{DS(ON)}$	--	23	28	m Ω
	$V_{GS}=4.5V, I_D=4.0A$		--	25	30	
	$V_{GS}=2.5V, I_D=2.5A$		--	28	34	
	$V_{GS}=1.8V, I_D=1.5A$		--	45	52	
Forward Transconductance	$V_{DS}=10V, I_D=3.8A$	g_{FS}	--	30	--	S
Diode Forward Voltage	$I_S=1.0A, V_{GS}=0V$	V_{SD}	--	0.8	1.3	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1MHz$	C_{iss}	--	570	--	pF
Output Capacitance		C_{oss}	--	60	--	
Reverse Transfer Capacitance		C_{rss}	--	30	--	
Total Gate Charge	$V_{DS}=15V, V_{GS}=4.5V, I_D=3.4A$	Q_g	--	6	10	nC
Gate-Source Charge		Q_{gs}	--	1.0	--	
Gate-Drain Charge		Q_{gd}	--	0.8	--	
Turn-On Time	$V_{DD}=15V, R_L=4.3\Omega, I_D=3.5A, V_{GEN}=4.5V, R_G=1\Omega$	$t_{d(on)}$	--	6	12	ns
		t_r	--	10	20	
Turn-Off Time		$t_{d(off)}$	--	20	40	
		t_f	--	10	20	

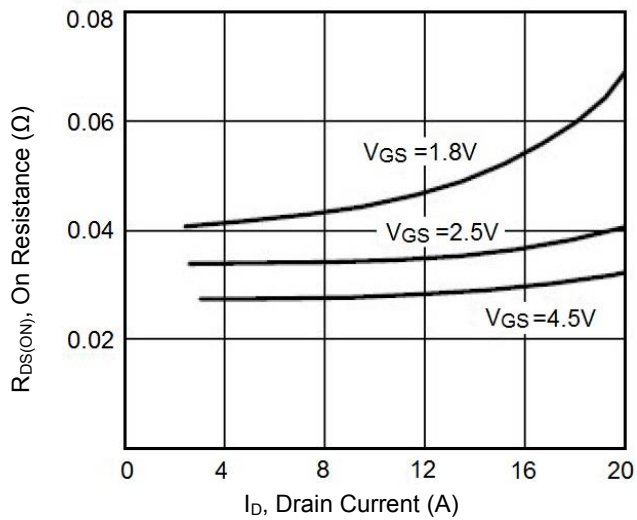
Notes: $T_A = 25^\circ C$ unless otherwise noted

CHARACTERISTIC CURVES

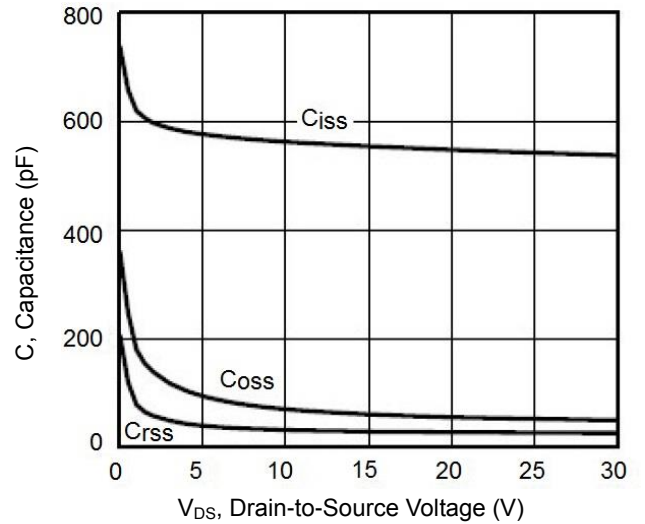


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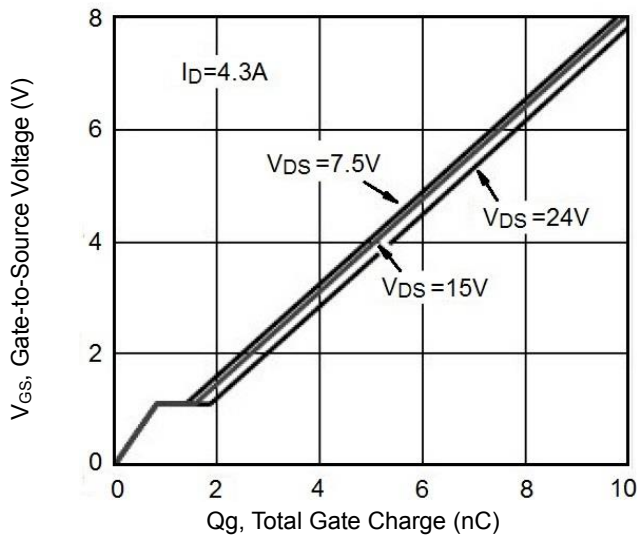
On-Resistance vs. Drain Current and Gate Voltage



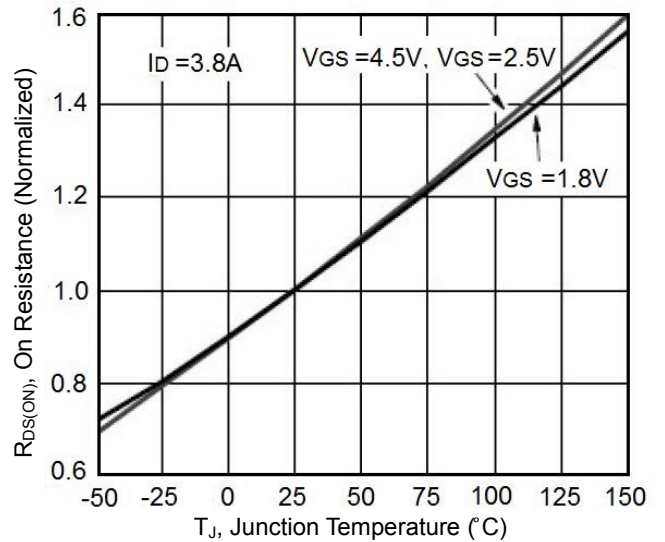
Capacitance



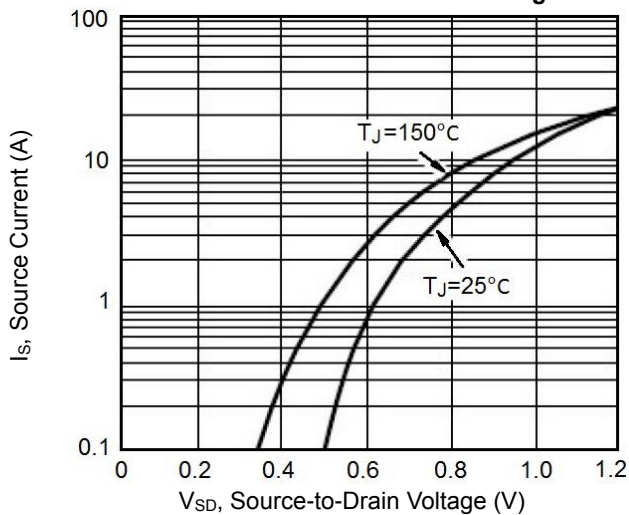
Gate Charge



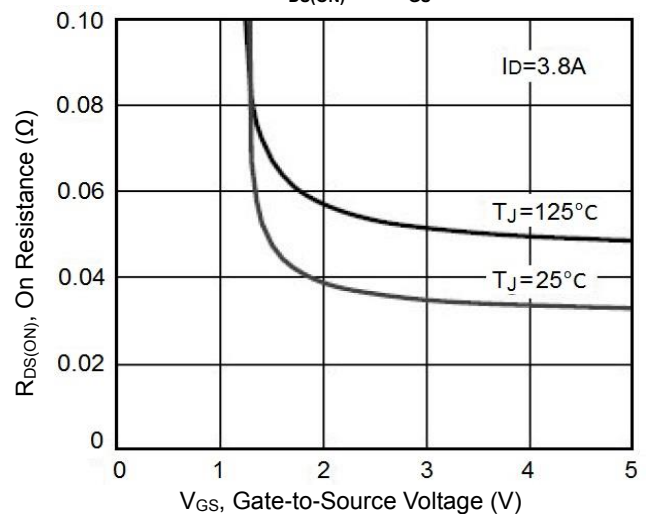
On-Resistance vs. Junction Temperature



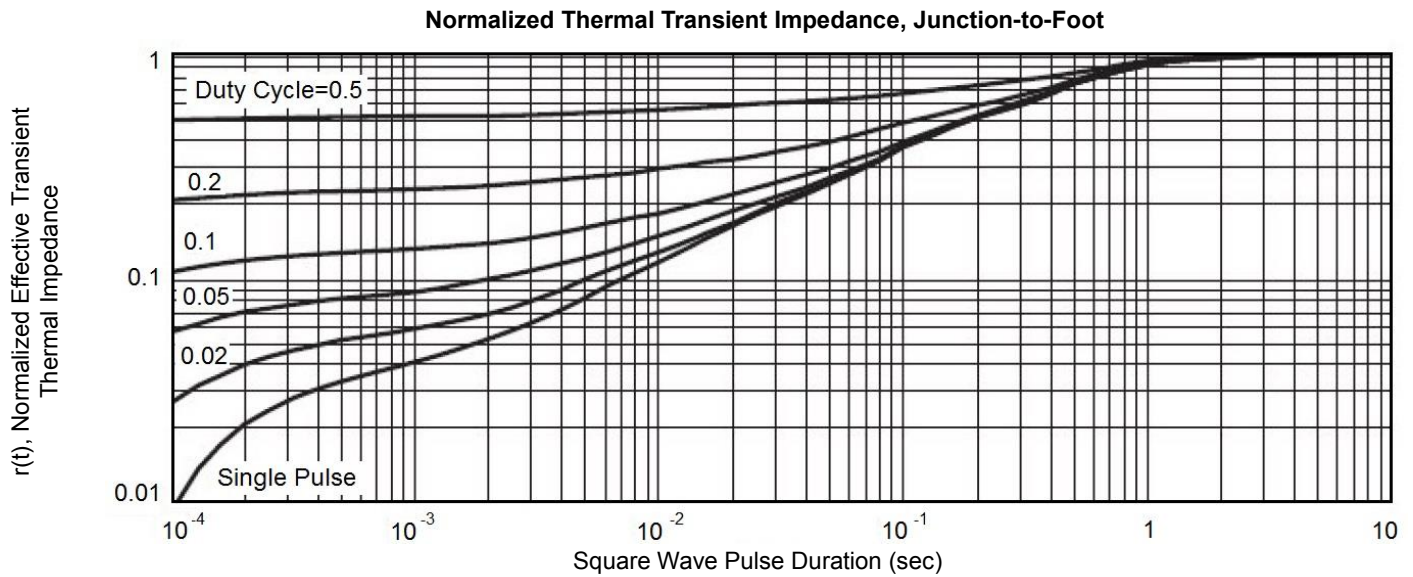
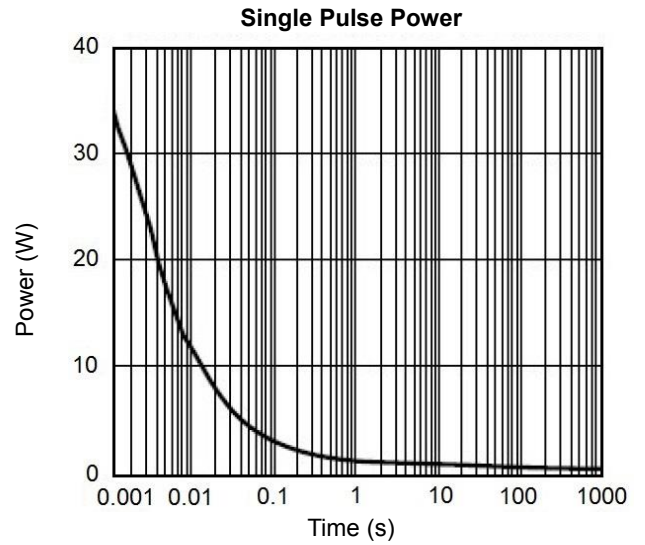
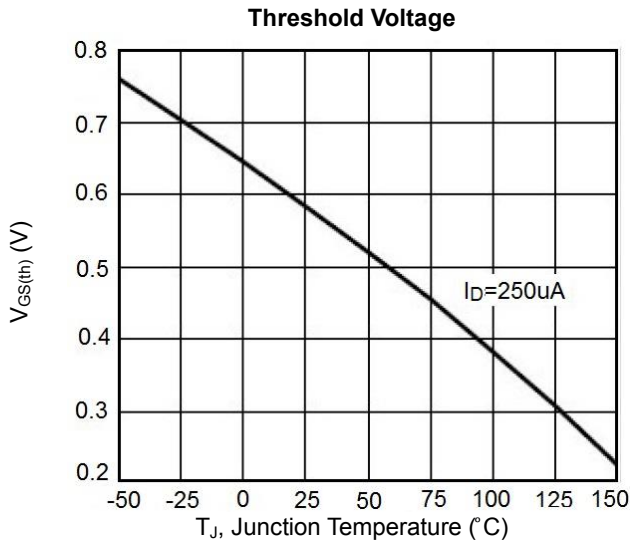
Source Drain Diode Forward Voltage



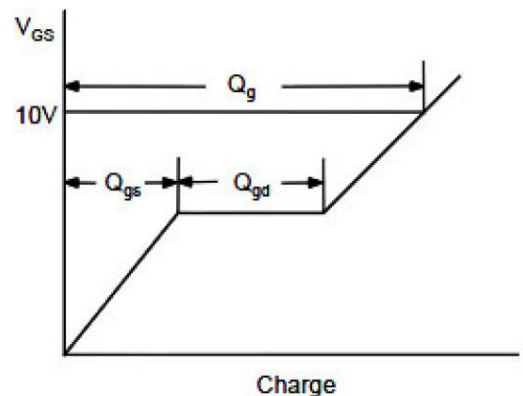
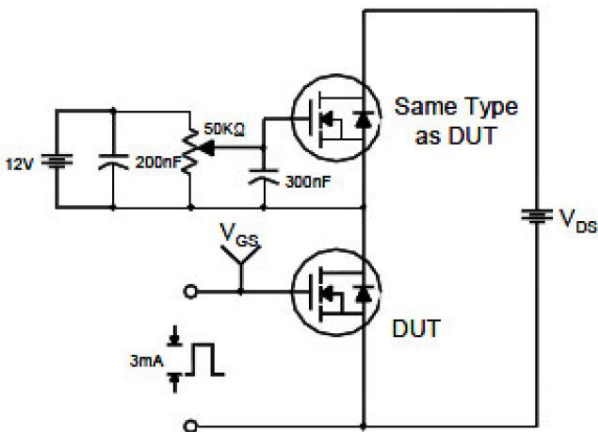
$R_{DS(on)}$ vs. V_{GS}



CHARACTERISTIC CURVES



Gate Charge Test Circuit & Waveform



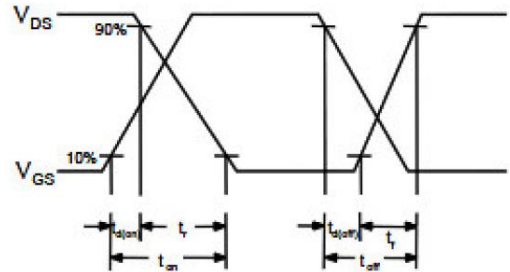
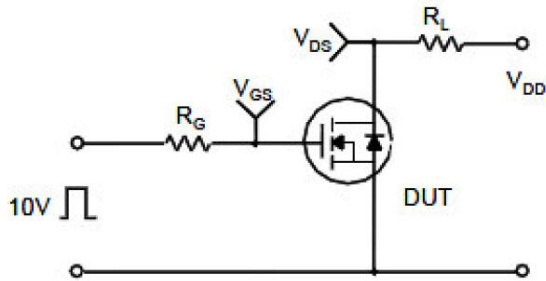
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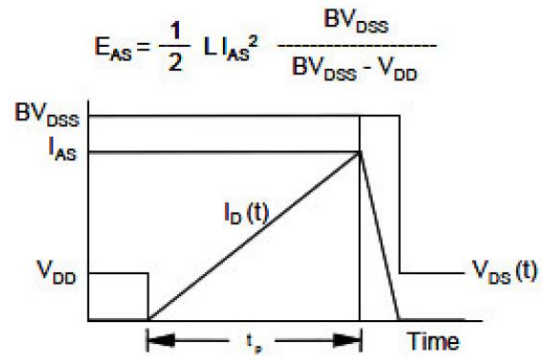
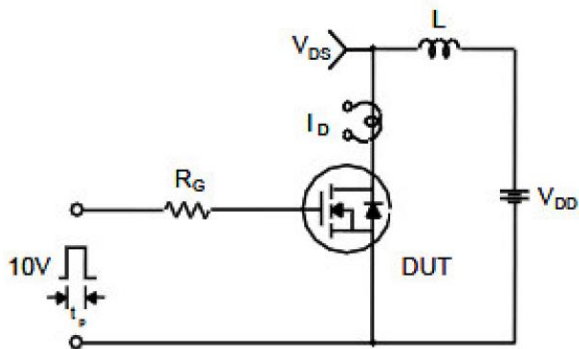
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CHARACTERISTIC CURVES

Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



*Specifications subject to change without notice.